found that lack of Ankrd11 expression at the developing bone fronts resulted in incomplete closure of the interfrontal sutures and disturbed frontonasal suture growth.

Conclusions: Results provided firm evidence to suggest Ankrd11 expression defines precursors for several craniofacial tissues, including suture junctions residing between nasal, frontal, and premaxillary bones. Ankrd11 expression may be used to predict growth at suture junctions by coordinating osteoblast and osteoclast activity. Its importance in gene therapy cannot be underestimated, particularly when applied to osteogenic disorders in humans.

0305: MOBILE PHONES IN CLINICAL PRACTICE: REDUCING THE RISK OF BACTERIAL CONTAMINATION

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Introduction: Mobile smart phones have become integrated into clinical practice however studies suggest them to represent reservoirs for pathogens. Effective hand hygiene may limit their infective potential. This study aimed to investigate the level of contamination on phones used on surgical wards and identify strategies for their safe use within clinical areas.

Methods: Fifty touchscreen phones from members of the multidisciplinary team in a surgical unit were sampled. Phones were swabbed using a standardised technique and samples streaked out using an automated specimen inoculator onto culture media (Columbia blood agar and MacConkey agar). Colonies were identified and counted. A questionnaire investigating usage levels of phones was given to 150 healthcare workers.

Results: 60% of phones had contaminant isolated. 62% of phones had 3 colonies or less isolated. No pathogenic or drug resistant strains of bacteria were identified. 88% of individuals sampled by questionnaire used their phone within the workplace of which 55% used it for clinical purposes. Hand hygiene audits within the unit at time of study showed 98% compliance.

Conclusions: Touch screen phones may be used safely in clinical practice, with low risk of cross contamination of nosocomial bacteria, in the setting of effective adherence to hand hygiene policies.

0376: THE USE OF NANOPARTICLES TO INVESTIGATE THE INTERACTION OF POLYAMINES AND COLONIC MUCUS BARRIER FUNCTION

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Introduction: The colonic microbiome is an area of great research interest with studies suggesting bacteria influence host health and disease e.g. IBD. Colonic mucus has 2 layers: a dense inner layer impermeable to bacteria, & looser outer layer as their habitat. How this occurs is unclear. Polyamines e.g. spermine are produced by bacteria in the colon and experimentally increase mucus thickness fivefold, we investigate this with fluorescent nanoparticles.

Methods: Human colonic mucus harvested from normal colon following resection. Imaging: Spinning-disc confocal microscopy. 100 & 500nm fluorescent nanoparticles (100 & 5 μg/mL) added to mucus. 2D movies & 3D images acquired before & after 1mM spermine.

Results: Polyamines effects on mucus layers overlaying human colonic sheets in vitro includes explosive stimulation of mucus streaming. 500nm particles (5μg/ml) optimum for image analysis. 1mM spermine induces swelling of mucus gel (fresh & frozen). Nanoparticles static at the gel surface pretreatment, displayed altered motility profiles within the gel on addition of spermine increasing particle diffusion 2-fold.

Conclusions: The novel use of nanoparticles with confocal microscopy is a tool for investigating morphological & physiological characteristics of gastrointestinal mucus. The swelling phenomenon witnessed may explain how bacteria modulate the colonic mucus layer in health and disease.

0450: NOVEL MECHANISMS UNDERPINNING LOADING-INDUCED BONE FORMATION

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Introduction: Mechanical loading of bone is a potent anabolic stimulus albeit by an incompletely understood mechanism. Mechanically sensitive osteocytes and osteoblasts may co-ordinate this process. The hypothesis of this study is that soluble factors released by mechanically stimulated osteocytes and osteoblasts regulate both the proliferation and recruitment of bone forming osteoblasts and MSCs.

Methods: The MLO-Y4 cell line (osteocyte), MC3T3 cell line (pre-osteoblast) and C3H10T1/2 cell line (MSC) were used in this study. Osteocytes were cultured under static conditions or mechanically stimulated using a rocking platform. Conditioned media was placed upon osteoblast cells or MSCs for 72hrs with DNA concentration (cell number) determined by PicoGreen DNA assay. The migratory response was measured using a Boyden chamber assay. The experimental setup was repeated using the mechanosensitive osteoblasts as the effector cells.

Results: The addition of mechanically stimulated osteocyte conditioned media resulted in a significant increase in osteoblast and MSC proliferation and migration as compared to statically conditioned media. Furthermore, mechanically stimulated osteoblast conditioned media enhanced migration although contrastingly decreased the proliferation rate of both cell types.

Conclusions: This study demonstrates, for the first time, novel signalling mechanisms regulating loading-induced bone formation and proposes a novel regulatory feedback mechanism underlying this process.

0788: EVALUATION OF HUMAN CD69+ T-CELL PHENOTYPES AFTER CO-CULTURE WITH GENETICALLY-MODIFIED PIG MESENCHYMAL STROMAL CELLS: AN IN VITRO XENOTRANSPLANTATION MODEL

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Introduction: Genetically-modified pig mesenchymal stromal cells (pMSCs) downregulate human T-cell responses to pig antigens in vitro. These suppressive effects are associated with upregulation of CD69 expression on T-cells. We evaluated the phenotype of CD69+ T-cells after co-culture with pMSCs and the mechanisms of this suppressive effect.

Methods: MSCs from α1, 3-galactosyltransferase gene-knockout pigs transgenic for the human complement-regulatory proteins CD46 and CD55 (GTKO/46/55 pMSCs) were co-cultured with human PBMCs for 48 hours prior to stimulation with phytohemagglutinin (PHA). PBMC proliferation was assessed by thymidine incorporation. After co-culture, CD69+CD4+ and CD69+CD8+ T-cell phenotypes were evaluated by flow cytometry.

Results: Following co-culture with GTKO/CD46/CD55 pMSCs, human PBMCs showed a significant reduction in proliferation in comparison to PBMCs cultured alone ($p<0.05$). GTKO/CD46/CD55 pMSCs did not induce human T cell apoptosis or upregulate CD25 or Foxp3 expression, indicating that they were not T-regulatory cells. Indeed, after co-culture, there were increased percentages of CD69+CD25-CD4+ and CD69+CD25-CD8+ T-cells, in comparison to PBMCs cultured alone.

Conclusions: Immune regulation of human T-cells by GTKO/CD46/CD55 pMSCs is not associated with either apoptosis or an increase in regulatory T-cells. Suppression of human T-cell proliferation is probably due to a distinct, and hitherto unknown, mechanism related to upregulation of CD69.

0818: THE NR4A2 ORPHAN NUCLEAR RECEPTOR IN COLON CANCER

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Introduction: The role of NR4A receptors in colorectal cancer is not well understood. In bladder cancer, cytoplasmic mislocalisation of the NR4A2 receptor has been shown to occur, and is associated with an adverse prognosis. This study aimed to examine the expression of NR4A2 in stage 2 colon cancer.

Methods: Immunohistochemistry was performed on a tissue microarray of stage II colorectal cancer with 4 cores of tumour and 4 cores of adjacent normal colonic tissue (n=148 patients). Staining was assessed by two